

REMARKS

Summary

This Amendment is responsive to the Office Action mailed on December 23, 2008. Claim 24 is amended. Claims 1-38 and 43 are pending.

Claims 24-26 are rejected under 35 U.S.C. § 102(e) as being anticipated by Monta (US 7,039,048).

Claims 1-14 and 43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Meggers (6,728,270) in view of Heddes (US 6,674,718) and further view of Demoney (US 6,721,789).

Claims 15-20 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Monta in view of Heddes.

Claims 21-23 and 28-38 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Monta in view of Heddes and Meggers.

Applicants respectfully traverse these rejections in view of the following comments.

Discussion of Amended Claims

Claim 24 is amended to specify one of determining or estimating an available channel capacity of a first channel and an available channel capacity of a second channel and to clarify that the first subset is selected for transmission through the first channel rather than through the second channel in the event that the available channel capacity of the first channel is sufficient to accommodate the first subset of data.

Discussion of Section 102(e) Rejection of Claims 24-26

Claims 24-26 are rejected under 35 U.S.C. § 102(e) as being anticipated by Monta. This rejection is respectfully traversed. An anticipation rejection requires that each and every element of the claimed invention as set forth in the claim be provided in the cited reference. See *Akamai Technologies Inc. v. Cable & Wireless Internet Services Inc.*, 68 USPQ2d 1186 (CA FC 2003),

and cases cited therein. As discussed in detail below, Monta does not meet the requirements for an anticipation rejection.

Amended independent claim 24 sets forth a method of transmitting a plurality of streams of data. In particular, it is determined whether a first subset of data associated with a first stream includes real-time data. Based on a determination that the first subset of data includes real-time data, the first subset of data is classified to distinguish it from a second subset of data associated with a second stream. An available channel capacity of a first channel and an available channel capacity of a second channel are determined or estimated. The first subset of data is then selected for transmission through the first channel rather than through the second channel in the event that the available channel capacity of the first channel is sufficient to accommodate the first subset of data.

Accordingly, independent claim 24 is directed towards assigning data to a communication channel based on whether the data includes real-time data after a determination as to available channel capacity is made.

In contrast, Monta describes a system for combining multiple streams for transmission over a channel. In Monta, if channel capacity is insufficient, then streams are further compressed in order to fit the existing channel capacity (Col. 15, lines 15-27). Monta does not disclose or suggest determining or estimating a channel capacity of a first and a second channel, selecting a channel based on available channel capacity, or rerouting a stream from one channel to another channel which may have more capacity at a later point in time. Further, the recompression performed in Monta degrades video quality, while stream reassignment as performed with Applicants' claimed invention does not.

Examiner refers to paragraph 14, lines 30 to 38 of Monta as support for disclosing "selecting a channel for transmission". The cited portion of Monta relied on by the Examiner refers to a selection made to accommodate a limitation on the number of tuners available at a particular receiver. This section has nothing to do with channel selection based on channel capacity or the existence of real-time data. In Monta, there is no need (or mention) of assignment of a stream to a particular communication channel based on whether it includes real-time data or

not.

Examiner also refers to Figure 2 and Col. 13, lines 26-38 of Monta as disclosing first and second subsets and classifying a subset having real-time data differently than other subsets using PIDS. Applicants respectfully submit that Figure 2 and Col. 13, lines 26-38 of Monta disclose a well-known method of encapsulating MPEG transport packets into the Ethernet frames used in IP networks. According to the MPEG transport packet spec (ISO 13818-1), all packets must include a PID in the header, and this PID is used to identify the stream that is associated with the packet. Since a subset of data generally consists of multiple video, audio, and data streams, each of which must be identified by a unique PID, there is no reason to believe that Monta is somehow using these same PIDs to identify a first or second subset, as is apparently assumed by the Examiner.

Accordingly, Monta does not disclose or remotely suggest determining whether a first subset of data associated with a first stream includes real-time data, classifying the first subset of data to distinguish it from a second subset of data associated with a second stream based on a determination that the first subset includes real-time data, determining or estimating an available channel capacity of a first channel and an available channel capacity of a second channel, where the first subset of data is then selected for transmission through a first channel rather than through a second channel in the event that the available channel capacity of the first channel is sufficient to accommodate the first subset of data, as is claimed by Applicants in claim 24. It is also noted in this regard that, in connection with the rejection of claim 15, the Examiner has acknowledged that Monta does not disclose “*reassigning or transferring a subset to a different multiplex*” (Office Action, page 8). Such an acknowledgement appears inconsistent with the Examiner’s position in the rejection of amended claim 24.

With respect to Applicants’ claim 25, the Examiner asserts that Monta discloses means for notifying receivers of updates to the data streams. Applicants’ claim 25 specifies transmitting the first subset through the first channel by switching the transmission from the second channel to the first channel, and the cited portion of Monta relied on by the Examiner has nothing to do with switching a subset of data from one channel to another based on a determination that it

includes real-time data.

Further, Applicants' respectfully submit that in Monta there is no mention of methods for informing receivers to retune to different channels in order to continue receiving the same data stream, as is apparently assumed by the Examiner.

With respect to Applicants' claim 26, the Examiner asserts that Monta discloses "*using PID (82 of Figure 2) and re-tuning user's receivers (column 14, lines 36-39)*". In fact, Monta only discloses methods for requesting IP data from an upstream switch to be forwarded to the multiplexing device (CherryPicker) which combines multiple streams to generate the subset of data which is to be broadcasted via a particular communication channel. In Monta, the receivers are downstream from the multiplexer (i.e., at the other end of the channel) and are not applicable to the sections of text cited by the Examiner. More importantly, there is no suggestion by Monta that streams might be reassigned from one communication channel to another channel, nor is there any discussion of how such a reassignment decision might be made, or how the reassignment might be implemented.

As Monta does not disclose each and every element of the invention as claimed, the rejections under 35 U.S.C. § 102(b) are believed to be improper, and withdrawal of the rejections is respectfully requested. See, *Akamai Technologies Inc., supra*.

Discussion of Rejection of Claims 1-14 and 43

Claims 1-14 and 43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Meggers in view of Heddes and in further view of Demoney.

The Examiner acknowledges that Meggers and Heddes do not disclose that the deadline for determining that a next packet of a real-time stream is to be transmitted before other packets of the streams is derived from at least one of a pre-existing synchronization time stamp and a pre-existing synchronization time-reference extracted from one or more of the packets carried in the plurality of streams, as set forth in claims 1 and 43. The Examiner relies on Demoney as disclosing this subject matter.

DeMoney describes a system for prioritizing requests for access to storage systems. This

is quite different from Applicants' claimed invention, which is concerned with scheduling packets for transmission to a plurality of receivers. It is however acknowledged that DeMoney does refer to the use of deadlines in the process of prioritizing requests for access to storage resources. However, DeMoney does not disclose or remotely suggest the use of pre-existing time stamps and/or time references extracted from packets of a stream, as set forth in Applicants' claims 1 and 43. Demoney specifies that "*the deadline for each request indicates a latest time by which the request must be fulfilled to meet a guaranteed maximum stream rate for the corresponding multimedia data stream*" (Col. 7, lines 17-21). This type of deadline discussed in Demoney is only useful if the stream data rate is constant and either known or inferrable. In the case of video, it is common to use a variable bit-rate encoding scheme where the data rate is varied depending on the complexity or compressability of the streams at a particular point in time. In such cases, deadlines derived using pre-existing time stamps and time references as claimed by Applicants are more useful and effective than the type of deadlines suggested by DeMoney. Neither the use of the type of deadlines claimed by Applicants' nor methods for deriving them are disclosed by DeMoney.

Accordingly, the combination of Meggers, Heddes, and Demoney does not disclose or remotely suggest a priority deadline that is derived from at least one of a pre-existing synchronization time stamp and a pre-existing synchronization time reference extracted from one or more of said packets carried in said plurality of streams, as claimed by Applicants in amended claims 1 and 43.

Further, Applicants respectfully submit that one skilled in the art would not have been motivated to combine the disclosures of Meggers, Heddes, and Demoney as suggested by the Examiner. Meggers relates to modification of real-time streams, Heddes relates to a computer networking system, and Demoney relates to a data storage system. Only with hindsight impermissibly gained from Applicants' disclosure could one of ordinary skill in the art have arrived at the conclusions reached by the Examiner.

Applicants respectfully submit that the present invention would not have been obvious to one skilled in the art based on Meggers in view of Heddes and Demoney.

Discussion of Rejection of Claims 15-20 and 27

Claims 15-20 and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Monta in view of Heddes.

The Examiner has acknowledged that Monta does not disclose reassigning or transferring a subset of streams to a different multiplex (Office Action, page 8). Also, as discussed in detail above in connection with claim 24, Monta does not disclose or remotely suggest selecting data for transmission over one channel rather than another or reassigning data from one channel to another. The arguments set forth above with regard to Monta are thus equally applicable to claim 15, which specifies selecting a subset of the plurality of streams being transmitted over a first digital multiplex and reassigning the subset to a second multiplex when the first multiplex has a first amount of data that exceeds a threshold.

The Examiner relies on Heddes as disclosing such a reassignment of a subset of streams.

Heddes describes a scheduler applicable to computer networks. This type of scheduler is suited for network switches and routers. The prioritization used by Heddes is solely based on queue fullness levels, as acknowledged by the Examiner.

Applicants respectfully submit that the Examiner has misconstrued Figure 10 of Heddes as indicating the Examination of the queue levels is used to assign packets to positions in the queues (Office Action, page 3). Rather, Figure 10 of Heddes appears to use a calendar to schedule the packets output from the queues based on priority or packet type, and does not appear to have anything to do with selecting packets for transmission based on whether the buffer has capacity for the packet or not. In fact, in Heddes, it is disclosed that above a certain Q_{max} , the data will be discarded (see, e.g., Figure 7, and Col. 13, lines 31-37) rather than reassigned.

Even if Heddes can be interpreted as disclosing the examination of queue levels for the purpose of reassigning positions in queues, such a concept is far removed from the seamless reassignment of a subset of streams from one multiplex to another in order to move the subset of streams from one communication channel to another, as set forth in claim 15. Unlike the computer networks targeted by Heddes, the present invention as claimed in claim 15 applies

where multiple communications channels are available for conveying information to receivers, and careful coordination with the receiver is essential during the multi-step process of reassigning streams from one channel to another via the multiplexes.

Applicants respectfully submit that Heddes does not disclose or remotely suggest reassignment of programs or data streams to different communication channels as suggested by the Examiner.

Thus, the combination of Monta and Heddes does not disclose or remotely suggest the subject matter of Applicants' independent claim 15:

- identifying a first digital multiplex of the plurality of digital multiplexes having a first amount of data that is being transmitted over a first communication channel, where said first amount exceeds a first threshold for said first communication channel;
- identifying a second digital multiplex of said plurality of digital multiplexes having a second amount of data that is being transmitted over a second communication channel, where said second amount does not exceed a second threshold for said second communication channel;
- selecting a subset of said plurality of streams being transmitted over said first digital multiplex; and
- reassigning said subset to said second digital multiplex.

In addition, Applicants respectfully submit that one skilled in the art would not have been motivated to combine the disclosures of Monta and Heddes as suggested by the Examiner. Monta describes a system for combining multiple streams for transmission over a channel, while Heddes relates to a computer networking system. Only with hindsight impermissibly gained from Applicants' disclosure could one of ordinary skill in the art have arrived at the conclusions reached by the Examiner.

Applicants respectfully submit that the present invention would not have been obvious to one skilled in the art based on Monta in view of Heddes.


Further remarks regarding the asserted relationship between Applicants' claims and the prior art are not deemed necessary, in view of the foregoing discussion. Applicants' silence as to any of the Examiner's comments is not indicative of an acquiescence to the stated grounds of rejection.

Withdrawal of the rejections under 35 U.S.C. § 102(e) and 35 U.S.C. § 103(a) is therefore respectfully requested.

Conclusion

The Examiner is respectfully requested to reconsider this application, allow each of the pending claims and to pass this application on to an early issue. If there are any remaining issues that need to be addressed in order to place this application into condition for allowance, the Examiner is requested to telephone Applicants' undersigned attorney.

Respectfully submitted,



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